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Abstract

How is jurisdiction transferred from an individual's biological body to agents of power such as the police, public prosecutor and judiciary, and what happens to these biological bodies when transformed from private into public objects? These questions are examined by analyzing bodies situated at the intersection of science and law. More specifically, the transformation of 'private bodies' into 'public bodies' shall be analyzed by going into the details of forensic DNA profiling in the Dutch jurisdiction. It will be argued that various 'forensic genetic practices' enact different 'forensic genetic bodies'. These enacted forensic genetic bodies are connected with various infringements of civil rights, which become articulated in exploring these forensic genetic bodies' 'normative registers'.

Introduction[1]

In recent years sociological studies of forensic science have gained momentum. In particular, forensic DNA profiling has received a considerable degree of scrutiny from scholars drawing upon approaches from Science and Technology Studies.[2] These studies have addressed issues including the most plausible interpretation over DNA evidence, questions regarding the most credible expert witness, and how rules for evidence contribute to the scope and content of DNA evidence. In addition to this research, recent studies on forensic DNA profiling focussed on the application of

[1] Alex Faulkner and Christopher Lawless gave me the opportunity to contribute to the volume, reviewed and commented on earlier drafts, and corrected the English. Valuable comments were also provided by an anonymous reviewer of the Journal of Law and Society, Bart van der Sloot and Katharina Paul. I want to thank all of them for support and stimulating me to proceed.

[2] Aronson, Jay (2007) *Genetic Witness: Science, Law, and Controversy in the Making of DNA Profiling*. New Brunswick, NJ: Rutgers University Press; Jasanoff, Sheila (1998). The eye of everyman: witnessing DNA in the Simpson trial. *Social Studies of Science* 28(5/6): 713; Lynch, Michael (1998). The discursive production of uncertainty: the OJ Simpson 'Dream Team' and the sociology of knowledge machine. *Social Studies of Science* 28(5-6): 829-68; Lynch, Michael, Cole, Simon, McNally, Ruth, & Jordan, Kathleen (2008). *Truth Machine. The Contentious History of DNA Fingerprinting*. Chicago & London: The University of Chicago Press.

forensic DNA profiling in criminal investigations and the (inter) national governance of DNA databases.[3] Only little attention has been devoted to the relation between forensic DNA profiling, biological bodies and bodily samples.[4] It is this nexus which is addressed in the present contribution by analyzing how biological bodies and bodily samples are fitted into forensic DNA practices situated at the intersection of (forensic) science and (criminal) law. More specifically, forensic DNA profiling in the Netherlands shall be analysed, and how, as the result of the continuous advancing applications of DNA profiling, biological bodies and bodily samples become ever more important markers for the pursuit of finding judicial truth, administering justice and crime control.

In what follows I elucidate the scientific and legal mechanisms which have evolved to transfer jurisdiction over an individual's biological body to agents of judicial power, including police, public prosecutor and the judiciary. I identify these by first analyzing an example of a medical case and second, by introducing forensic DNA profiling by way of simplified example. Next, I shall articulate the identified mechanism by shortly enquiring the work of Michel Foucault and Giorgio Agamben on biopower. In the succeeding section, I will analyze Dutch forensic genetic practices, and how biological bodies and bodily samples are fitted into those practices. I will do this by tracing how forensic DNA technologies and laws to regulate them have co-evolved over the past twenty years. I will demonstrate that different forensic genetic practices emerged – one directed at individuals, another at populations –, and that these different practices come along with different normative issues. In the concluding section, I will summarize the findings and draw overarching lessons.

Identifying the mechanism

Most people would intuitively accept the slogan that 'I own my body'. Such statement underscores the individual mastery over a particular body and delineates the private from the public. Yet, if you are under suspicion or convicted for a crime or when you are diagnosed with a specific disease or mental condition, the slogan may not apply anymore; you can be arrested, searched, taken into custody, hospitalized or you may be forced to take medications. The body that once was yours becomes an object of incrimination, incarceration, care or treatment. When jurisdiction over a body is transferred from an individual to agents of power like police and medics, those bodies transform from 'private bodies' into 'public bodies'.

An analysis regarding the transformation of private into public bodies is provided by American social geographer David Delaney.[5] He describes a case where an inmate is diagnosed with a mental disorder. The patient/prisoner receives pharmaceutical treatment, yet withdraws consent for treatment after he experiences deleterious effects caused by the medication. Bypassing his will, the

[3] Hindmarsh, Richard, & Prainsack, Barbara (Eds.). (2010). *Genetic Suspects. Global Governance of Forensic DNA Profiling and Databasing*. Cambridge: Cambridge University Press; Prainsack, Barbara, & Toom, Victor (2010). The Prüm regime: Situated dis/empowerment in transnational DNA profile exchange. *British Journal of Criminology 50*(6), 1117-1135; Williams, Robin, & Johnson, Paul (2008). *Genetic Policing. The Use of DNA in Criminal Investigations*. Cullompton, Devon: Willan Publishing.

[4] An exception is: Kruse, Corinna (2010). Forensic evidence: materializing bodies, materializing crimes. *European Journal of Women's Studies* 17(4): 363-377.

[5] Delaney, David (2001). Making nature/marking humans: law as a site of (cultural) production. *Annals of the Association of American Geographers*, 91(3): 487-503.

state legally continues to administer the drugs to the inmate and hence he becomes the 'unwilling recipient of a sort of "synthetic sanity"'.[6] In other words, his body is put under restraint, 'his skin and muscles are penetrated by the state apparatus of the syringe, his circulatory and nervous systems are colonized by the authorities aided by pharmaceutical corporations.'[7] In this act of putting his body under restraint – that is: when a private body is transformed into a public body –, several normative and legal issues arise: individual consent and autonomy are bypassed and his right to an inviolable body is breached. His body is not his' anymore. Or, as Delaney puts it, the inmates' body becomes 'a material slab, a zone between his self and the outer institutional environment.'[8]

Before any individual can be made a ward of court, evidence that he is not able to take care of himself should be provided. In the example provided by Delaney, it can be assumed that the inmate was tested both mentally and physically, using the Diagnostic and Statistical Manual of Mental Disorders (DSM), observations of and interviews with the person, and evaluation of the collected data. These results are compared with other scientific data, like fMRI scans or neurochemically tested samples. Individuals can only be placed under courts' ward if the results point at the same mental condition. Hence, scientific evidence warrants the legal decision of transferring jurisdiction over a body from the individual to an authority – such body *becomes* constituted as a 'body of science and law'.

The criminal justice system is a domain where private bodies are rendered into public bodies routinely. Several mechanisms are in place to achieve this, the most straightforward being the arrest or imprisonment of individuals. Such public bodies can be regarded as 'bodies of law' as legal mechanisms are in place to warrant arrests etc. Bodies of science and law have been around for as long as the 19th century, when scientific methods, like dactyloscopy (fingerprinting) and anthropometry (biometrics) already were applied to make representations of individuals and their bodies.[9]

Since the introduction of forensic DNA profiling in criminal justice systems, the bodies of science and law changed considerably, not least because the latter technology analyzes bodily samples. The example below will introduce forensic DNA profiling and its intimate relationship with bodies and bodily samples.

> A break-in was reported by a witness who saw a man smashing-in a window. After the police had arrived, a crime scene examiner collected a piece of glass and secured a stain of blood probably originating the burglar. The blood trace was submitted to a forensic laboratory where a DNA profile was obtained and subsequently uploaded to the national DNA database. In the mean time, the police arrested an individual on suspicion of having committed the burglary. He was asked to provide a biological reference sample, which he refused to do. He was then physically forced by two police officers, on which occasion his mouth was opened to take a buccal swap. The sample was processed at the forensic laboratory and it matched the DNA crime scene sample. Such match usually is expressed as a

[6] id., p. 499.
[7] id., p. 499.
[8] id., p. 499.
[9] Cole, Simon (2001). *Suspect Identities. A History of Fingerprinting and Criminal Identification*. Cambridge [Mass.] & London: Harvard University Press.

> statistical number (the random match probability), stating the chance that someone in the population at large would have the same DNA profile is less than one in a billion.[10]

Agents of power like the police and public prosecutor are, since the introduction of forensic DNA profiling in criminal justice systems, advancing further into personal spheres, thereby rendering the personal into public objects.[11] The radical shift that has occurred is that crime investigation and criminal litigation have become intimately connected with body samples and the production of genetic knowledge about those samples, and hence its originators. It is in this capacity that the mechanism that enables forensic DNA profiling resembles key aspects of Michel Foucault's analysis of 'biopower'. First, genetic and subsequent digital representations of bodies are produced, enabling the comparability of bodily samples originating from a subject and bodily traces collected at crime scenes. Such representations contain *knowledge* of the originator's body that goes beyond 'the science of its functioning'.[12] Second, authorities involved in criminal investigation gained procedural powers to collect biological samples from subjects, process the samples into DNA profiles, and store samples and profiles in biobanks and databases for many years. So authorities gained a *mastery* over those bodies and body parts for a specific amount of time which 'is more than the ability to conquer them'.[13] Mastery over bodies and the ability to produce knowledge about them are central to Foucault's analyses regarding the workings of power and its relationships with bodies.[14]

Yet, to appreciate what goes on in forensic DNA profiling, and to be able to analyze the normative consequences of the routine criminal justice mechanism that renders private bodies into public bodies, it is essential to enquire briefly into political philosophy and legal theory. Everybody in a democratic state of law is entitled to civil rights. Examples are freedom of speech, religion, association and opinion. Such rights, especially in Continental liberal democracies, are laid down in a system of rights usually referred to as the Constitution. Rights of the 'self' are, in the context of forensic DNA profiling, regarded as personal lives and the integrity of individual bodies. In order to protect these realms against the power of the state and its institutions, like police, Office of Public Prosecution and judiciary, individuals, their bodies and personal lives are assigned civil rights.

More specifically, and turning to the Netherlands as a case study, personal lives and individual bodies are protected by articles 10 and 11 of the Dutch Constitution, which read that everyone shall 'have the right to respect for his privacy' and 'have the right to inviolability of his person'.[15] These rights are not absolute rights as they can be curtailed according 'restrictions laid down by or

[10] The example is derived from: Toom, Victor (2011). *Dragers van Waarheid. Twintig Jaar Forensisch DNA-onderzoek in Nederland* (Carriers of Truth. Twenty Years of Forensic DNA Profiling in the Netherlands). Deventer: Kluwer Press.

[11] Alcohol and drug tests are also dependent on the use of body samples. Yet, the police in the Netherlands never had legal powers to physically enforce individuals to supply body samples.

[12] Foucault, Michel (1977). *Discipline and Punish. The Birth of the Prison*. Harmondsworth: Penguin, p. 26.

[13] id., p. 26.

[14] id., p. 26.

[15] Ministry of the Interior and Kingdom Relations (2002). *The Constitution of the Kingdom of the Netherlands*. The Hague: Ministry of the Interior and Kingdom Relations. Both articles are in concordance with article 8 of the European Convention on Human Rights and article 12 of the Universal Declaration on Human Rights. In Anglo American jurisdictions, violations of the body sometimes are defined as an infringement of 'spatial' privacy, whereas personal information usually is called 'informational' privacy, see: Laurie, Graeme (2002). *Genetic Privacy. A Challenge to Medico-Legal Norms*. Cambridge: Cambridge University Press.

pursuant to Act of Parliament'.[16] In other words, personal lives and individual bodies can be violated by authorities involved in criminal investigation when conditions are met as described in the Code of Criminal Procedures. With regard to Dutch DNA profiling, the Code of Criminal Procedures delineates when privacy and the right to an inviolable body do not apply to an individual, and typically include suspects and convicted offenders (see further below). Bodies and personal lives of these categories of individuals are excluded from articles 10 and 11 of the Dutch Constitution. Their bodies and bodily samples are, echoing Giorgio Agamben's influential work on contemporary mechanisms of biopower, are legally in a 'state of exception'.[17]

This section has identified the mechanisms of how agents of power are progressing into personal spheres when forensic DNA profiling is applied. The mechanism works on three different levels. First, authorities involved in criminal investigation gain mastery over individual bodies. Second, this mastery can only be gained when individuals and their bodies are stripped of entitlements to civil rights. Third, only when these conditions are met, forensic genetic knowledge about those bodies can be produced. This mechanism renders private bodies into public bodies constituted both in science and in law. To delineate these produced pubic bodies from other conceivable public bodies (like the one described by Delaney and other biometric bodies), I will call these bodies 'forensic genetic bodies'. Having established this trend, details of Dutch forensic DNA profiling will next be analyzed, by tracing the co-evolution of forensic DNA technologies and laws to regulate them.[18] The aim of the analysis presented in the next section is to empirically establish how forensic genetic bodies have been enrolled into the criminal justice system, and what normative consequences this enrolment has.

Forensic genetic practices in the Netherlands

The present section traces developments in the Dutch jurisdiction regarding forensic DNA profiling and criminal law to regulate it. It will be argued that two related yet different 'forensic genetic practices' have emerged: one directed at individuals, the other at populations. My analysis does not start with a fixed idea of what forensic DNA profiling *is*, but what it *becomes* when it is used in forensic genetic practice – when it is being practiced in a 'situated event'.[19] In addition to analyzing these practices, the aim of this section is to empirically establish how private bodies are transformed into forensic genetic bodies and to articulate the variety of normative (or political) concerns involved. These different sets of normative concerns I shall refer to as 'normative registers'. This reflects my aim of cataloguing the normative content of each forensic genetic practice and how bodies and bodily samples are incorporated into that practice. The work of Dutch philosopher Annemarie Mol will guide me to practices, bodies and normative registers. She proposed using the

[16] Ministry of the Interior and Kingdom Relations, 2002, op. cit., n. 15, p. 6.
[17] Agamben, Giorgio (1998). *Homo Sacer. Sovereign Power and Bare Life*. Stanford, California: Stanford University Press.
[18] This process has been coined 'biolegality', see Lynch, M. and McNally, R. (2009), 'Forensic DNA Databases: The Co-Production of Law and Surveillance Technologies', in P. Atkinson, P. Glasner and M. Lock, eds, Handbook *of Genetics and Society: Mapping the New Genomics Era*, 283–301. London, UK: Routledge.
[19] Mol, Annemarie (2011). Actor network theory: sensitive terms and enduring tensions. *Kölner Zeitschrift für Soziologie und Sozialpsychologie* (50): 253-269.

concept 'enactment' for the analysis of the effects of interacting objects, logics and practices.[20] Or, as she states, enactment suggests 'that activities take place – but leaves the actors vague. It also suggests that in the act, and only then and there, something *is* – being enacted.'[21] In addition, enactment neatly resonates with the legal and political system that enacts laws. Science and law are the most prominent actors in my analysis here. This however does not mean that forensic genetic practices develop or become enacted outside of the influence of people, the social or institutions. Below, I first analyze forensic genetic practices aimed at individuals, how they enact 'known bodies' and how these known bodies have become associated with a specific normative register. Attention will then be devoted to new forensic genetic technologies aimed at determining personal external visible characteristics from 'unknown' human originators. I argue that this practice is dependent on another enacted forensic genetic body and is intimately connected with the organization of DNA dragnets. It shall be demonstrated how bodies are fitted-in into criminal investigation in novel ways. As such it generates another normative register which is characterised by its clustering capacities.

Individualizing forensic genetic practices

Like many other 'Western' jurisdictions, the Dutch judiciary accepted DNA evidence in the late 1980s.[22] The first DNA case in the Netherlands regarded a suspect who was convicted for rape by a trial judge yet proved to be innocent on appeal after volunteering a DNA sample. It was however legally impossible to use force against individuals to obtain reference samples as article 11 of the aforementioned Dutch Constitution applied to blood 'under the skin' and saliva 'in the mouth'. Many Members of Parliament realized that forensic DNA profiling could be a valuable addition to the arsenal of already existing technologies for individualization. It was therefore relatively soon decided to make mandatory DNA profiling legally possible by redistributing jurisdiction over bodies and biological samples therein from individuals to the judiciary when specific circumstances were met. But before such measures could be enacted, technical, legal and ethical issues had to be considered.

Forensic DNA technologies as applied until the mid 1990s were infamous due to several drawbacks, including susceptibility to false interpretation and contamination, the lack of any rigorous standards for the production and interpretation of DNA profiles, its high costs and the duration of the cycle of analysis.[23] In addition to these problems, forensic DNA technologies were dependent on samples containing high quantity, non-degraded DNA typically available in blood and semen, which linked forensic DNA typing to severe and violent crimes like rape and murder. Obtaining blood samples from suspects was consequently an 'obligatory point of passage' for reliable DNA profiling.[24] Yet,

[20] Mol, Annemarie (2002). *The Body Multiple. Ontology in Medical Practice*. Durham: Duke University Press.
[21] id., p. 33 (emphasis in original).
[22] Hindmarsh & Prainsack 2010, op. cit., n. 3.
[23] For a full discussion, see: Lander, Eric S. (1989). DNA fingerprinting on trial. *Nature, 339*(6225), 501-505; Lander, Eric S. (1992). DNA fingerprinting: science, law, and the ultimate identifier. In Daniel J. Kevles & Leroy Hood (Eds.), *The Code of Codes. Scientific and Social Issues in the Human Genome Project*. Cambridge [Mass.] & London: Harvard University Press. For STS analyses on technical, scientific and legal issues, see: Lynch et al 2008, op. cit., n. 2; Aronson 2007, op. cit., n. 2.
[24] For the term obligatory point of passage see: Callon, Michel (1986), 'Some elements of a sociology of translation: domestication of the scallops and the fishermen of St. Brieuc Bay', *in* Law, J. (ed.), *Power, Action and Belief. A New Sociology of Knowledge?* London: Routledge & Kegan Paul.

using force to obtain blood samples was considered to be a drastic infringement of a suspect's right to an inviolable body.

All these issues were considered when a first bill was drafted to govern forensic DNA profiling in the Netherlands, which resulted in the 1994 Forensic DNA Profiling Act.[25] This piece of legislation rendered it impossible for certain classes of suspects to appeal to the right of an inviolable body: high thresholds were implemented before body samples could be taken without consent. First, only suspects who were under suspicion for having committed a crime with a liability of eight years or more imprisonment (i.e. sex crimes, homicide) could be forced to provide a DNA sample. And second, DNA profiling of a suspect's biological sample could only be ordered by an investigating judge as a representative of the judiciary. It is for these two reasons that forensic DNA profiling initially became enacted as an evidentiary practice for severe and violent crimes.

An invention awarded the Nobel Prize for Chemistry in 1993 would come to interfere with the evidentiary practice for severe and violent crimes. This technique, called the polymerase chain reaction (PCR), allowed for multiplying biological samples *in vitro* and subsequently detached forensic genetic technologies from large stains of blood and semen. It contributed importantly to, first, the possibility of analyzing DNA traces typically present on mundane physical traces (cigarette butts, glasses, garments) often collected at scenes of less severe crime (e.g. burglary and car theft), and, second, rendered it possible to produce DNA profiles obtained from buccal swabs instead of blood.

Geneticists started developing new forensic genetic typing systems in the early and mid 1990s.[26] These systems combined PCR with so-called 'short tandem repeats' (STRs). STRs had several advantages when compared to forensic DNA techniques applied earlier. The production of DNA profiles became standardized and partly computerized. Hence, as a first advantage, interpretive problems regarding DNA profiles were moved to the background. Various STR markers were combined in so-called multiplexes; consequently several STRs could be determined in one reaction, contributing importantly to, as a second advantage, the speed of forensic DNA profiling. The need for less interpretation combined with a faster throughput let to a third advantage: DNA profiling became cheaper. Last but not least, as a fourth advantage, STRs have a numerical format and hence allowed for digitally storing DNA profiles in databases.[27]

In 2001, an amendment to lower the thresholds for mandatory DNA analysis was added to the Forensic DNA Profiling Act. An important justification for the expansion of forensic DNA profiling was the less severe violation of a body when a saliva sample is obtained (vis-à-vis a blood sample). Mandatory DNA typing became legally possible when someone was under suspicion of having committed a crime with liability of four years of imprisonment (e.g. burglary, car theft). The 2001

[25] M'charek, Amade (2008). Silent witness, articulate collectives: DNA evidence and the inference of visible traits. *Bioethics 22*(9): 519-528; Toom, Victor (2006). DNA fingerprinting and the right to inviolability of the body and bodily integrity in the Netherlands: convincing evidence and proliferating body parts. *Genomics, Society & Policy 2*(3): 64-74.

[26] Sparkes, R., Kimpton, C., Watson, S., et al. (1996). The validation of a 7-locus multiplex STR test for use in forensic casework. (I) Mixtures, ageing, degradation and species studies. *International Journal of Legal Medicine, 109*(4), 186-194.

[27] Williams & Johnson 2008, op. cit., n. 3.

amendment included measures to facilitate the expected increase in forensic DNA typing, two of them importantly contributing to a newly enacted forensic genetic practice.[28] First, in addition to the investigating judge, responsibilities for ordering mandatory DNA analysis were also granted to the leader of the criminal investigation, the public prosecutor. As such, DNA profiling was not only to be considered criminal evidence, but also became rendered as a tool for criminal investigation. And second, competence for obtaining biological saliva samples was distributed to police officers if the suspect consented in providing a sample. When force was to be applied, physicians were to take the samples. Scope and application of forensic genetic practices as the result of interactions between science and law were thus extended from severe and violent crimes to volume crimes, and from evidence in criminal proceeding to investigative leads in criminal investigation.

The 1994 Act and its 2001 amendment both focussed on suspects. A new category of individuals was enrolled into forensic genetic practices when the DNA Convicted Persons Act came into force in 2005. This law applies to the category of convicted offenders (adults and juveniles) for crimes with a maximum liability of four years imprisonment or more. To prevent the Netherlands Forensic Institute becoming overloaded with biological samples to be DNA typed, it was decided to enact the law in two stages. The first stage came into force in 2005 and applied to persons convicted for crimes with a liability of six years or more imprisonment. Since May 2010, everybody convicted for crimes specified in the 2005 law is DNA typed.

Known bodies and DNA hunts

I have stated that my interest in analyzing forensic genetic practices regards the enactment of bodies of (forensic) science and (criminal) law, the forensic genetic body. A typical forensic genetic body becomes enacted when an individual is either suspected of having committed a crime or when s/he is convicted for a crime (both with a liability of four years or more punishable imprisonment). These bodies are 'known' by authorities in two different modes. First, police and prosecuting authorities know these bodies since they have been identified. Second, genetic knowledge will be produced from these bodies, which is the second mode of knowing. It is for these two reasons that I will refer to these enacted forensic genetic bodies as 'known bodies'. This raises the question how many known bodies have been enacted in the Netherlands.

In September 2011, it was announced that more than 124,000 DNA profiles from known individuals were uploaded (from a population of approximate 17 million) onto the Dutch DNA database.[29] The amount of uploaded DNA profiles to the DNA database can be interpreted as a proxy for the amount of known bodies. To obtain a sample, the right to an inviolable body (article 11 of the Constitution) in necessarily violated. Since genomic samples contain all genetic 'information' of an individual, privacy (article 10 of the Constitution) is also at stake. A majority view on the trends I am presenting here is that: these measures came in after restrictions were approved by an Act of Parliament; that many legal measures are in place that order forensic DNA profiling and warrant its proper use; that

[28] Toom, Victor (2010). 'Inquisitorial forensic DNA profiling in the Netherlands and the expansion of the forensic genetic body', in Hindmarsh & Prainsack 2010, op. cit., n. 3.

[29] The Dutch DNA database was established in 1997. For an actual overview of uploaded DNA profiles, see the website maintained by the Custodian of the Dutch DNA database: www.dnasporen.nl.

'known bodies' are most often real criminals; that criminals are less entitled to certain civic rights in open democratic societies; and that the balance between safety at large and the infringements of individual rights is maintained. Yet, what escapes attention of many policy workers, stakeholders and commentators is how these known bodies interfere with other legal principles, as the next contemporary example demonstrates.[30]

The DNA Convicted Criminals Act prescribes that every convicted offender, when s/he is convicted for a crime with a liability of four years of imprisonment or more, will be DNA typed. Crimes with such liability include severe and violent crimes (sex crimes, homicide), the category of volume crimes (burglary, car theft) and more petty crimes (shop lifting, being in possession of certain stolen goods, embezzlement). Bodies of convicted offenders for any of these crimes will be enacted as known bodies. There are two routes for gathering cellular material for forensic DNA analysis. The first route is that a convicted offender will be sentenced to jail – such usually applies to the more severe crimes, but also to categories of volume crime like burglary. When someone is incarcerated, there is ample opportunity for the authorities to obtain a reference sample. Convicted offenders for the more petty crimes will often receive a suspended sentence or are sentenced to probation or community service. Since everyone shall 'be treated equally in equal circumstance', samples from these individuals shall be DNA typed too.[31] Non incarcerated convicted offenders will receive a letter from the public prosecutor stating that that they are obliged to visit a 'DNA consult' at a local police station, on which occasion a reference sample will be taken for DNA analysis. When convicted offenders do not show up, the police will 'collect' them at their residential addresses during weekends, bank holidays or soccer matches.[32] These convicted offenders will be arrested and taken to the police station to obtain a reference sample. Hence, and to put it provocatively, the police organizes DNA hunts to gather biological samples from individuals convicted for crimes like shop lifting, being in possession of stolen goods or embezzlement.

DNA hunts on individuals convicted for petty crimes, therefore, are warranted by Dutch legislation. Yet one can wonder if such measures correspond to article 8 of the European Convention on Human Rights. Article 8 provides mechanisms for respect of private life, but can be violated when it is regarded as proportionate in a democratic society and 'in the interests of national security, public safety or ... for the prevention of disorder or crime'.[33] But will such collection from non-incarcerated convicted offenders contribute to the national security or public safety? Will such DNA hunts prevent future crimes? In addition to these questions, we can note that individuals are 'collected', taken into custody, and brought to a police station with the aim of taking a bodily sample for DNA

[30] By policy workers, I refer to ministers and their staff, Members of Parliament and other stakeholders involved in the criminal justice system, like police and the Office of Public Prosecution. Typical commentators favouring wider applications for forensic DNA typing are communitarian philosophers, for an example see: Etzioni, Amitai (2004). DNA Tests and Databases in Criminal Justice: Individual Rights and the Common Good. In David Lazer (ed.), *DNA and the Criminal Justice System: The Technology of Justice*. Cambridge [Mass.] & London: MIT Press.

[31] Article 1 of the Dutch Constitution, see: Ministry of the Interior and Kingdom Relations 2002, op. cit., n. 15.

[32] See for example: Politie Brabant Zuid-Oost, press release 27 May 2009. *Politie haalt 90 veroordeelden op ten behoeven van DNA-afname* [Police collects 90 convicted offenders for DNA research]; Limburgse Courant, 6 May 2010. *33 personen aangehouden voor verplichte DNA-afname* [33 persons arrested for mandatory DNA research].

[33] Council of Europe (1950). *Convention for the Protection of Human Rights and Fundamental Freedoms*. Strasbourg: Council of Europe, article 8.

analysis. Should this be regarded as a proportionate measure, especially in the light of these individuals often being convicted for petty crimes, and becoming stigmatized when family members and neighbours see how these individuals are 'collected' by police officers? These questions become even more urgent since more than 10% of non-incarcerated individuals are under 18 years and hence are subject to the Dutch system of youth justice yet their profiles are retained long after they become legally adults. Such is 'inconsistent with the special consideration ... in the way children (especially younger children) are dealt with in the criminal justice system.'[34] Information provided by the police indicates that approximate 40 per cent of the convicted offenders do not present themselves at the DNA consults.[35] On top of that, DNA hunts require substantial capacity in officers and fiscal investments in police forces. Hence, DNA hunts may, paradoxically, advance at the expense of more traditional policing tasks, like surveillance and prevention of criminal activities. Put differently: organizing a DNA hunt with the aim of collecting samples from known bodies may demonstrate one way in which the police are working hard to make society safer, yet arguably this does not contribute to a safer society.

Clustering forensic genetic practices

Although DNA profiling often is considered the most important forensic breakthrough since the application of fingerprints in the late 19th century,[36] individualizing DNA profiles aimed at comparing traces with reference profiles can be considered 'traditional' forensic genetic technology.[37] Recent genetic insight enables new applications for forensic DNA profiling, for instance the examination of biological crime scene samples to predict external visible characteristics – like geographical descent, sex, hair and eye colour, and age – of an unknown originator.[38] Such a technique was applied for the first time in the Dutch jurisdiction when 16 year old Marianne Vaatstra was found raped and murdered in a pasture on the morning of 1 May 1999. Apart from an abundance of DNA traces, no other crime-related facts or clues were particularly useful for the criminal investigation – as a result, the case remains unsolved. In attempts to find the murderer, genetic technologies to predict external visible characteristics were applied and suggested that the perpetrator originated from North West Europe.

Although this information aided the criminal investigation its articulation demonstrated a legal problem: the 1994 Forensic DNA Typing Act defined DNA profiling as *exclusively* aimed at comparing DNA profiles. In other words, it was legally not allowed to use genetic technologies to determine external visible characteristics, unless the law were to be amended. Consequently, in 2003, the Law on External Visible Personal Characteristics was enacted and it did regulate the determination of

[34] Levitt, Mairi & Tomasini, Floris (2006). Bar-coded children: an exploration of issues around the inclusion of children on the England and Wales National DNA database. *Genomics, Society and Policy 2*(1): 41-56, p. 52.
[35] Limburgse Courant, op. cit., n. 32.
[36] Cole 2001 op. cit., n. 9; Jasanoff, Sheila (2010). Foreword. In Hindmarsh & Prainsack 2010, op. cit., n. 3.
[37] Koops, Bert-Jaap, & Schellekens, Maurice (2008). Forensic DNA phenotyping: regulatory issues. *The Colombia Science and Technology Law Review, 9*(1), 158-202.
[38] Kayser, Manfred, & Schneider, Peter M. (2009). DNA-based prediction of human externally visible characteristics in forensics: motivations, scientific challenges, and ethical considerations. *Forensic Science International: Genetics, 3*(3), 154-161; Kayser, Manfred & De Knijff, Peter (2011). Improving human forensics through advances in genetics, genomics and molecular biology. *Nature Review: Genetics, 12*(3): 179-192.

external visible characteristics of 'unknown' suspects by forensic genetic methods. It currently governs two physical traits: sex and race. The law was deliberately designed as 'window-case legislation' to enable future physical traits to be included in the law, and to enable further genetic research for these purposes (see further below). As a result, a third external visible characteristic (eye colour) to be added to the law is currently pending in Parliament.

Making predictions about external visible characteristics of the unknown suspect may be useful for police investigations when the 'usual suspects' (family, friends, partners, acquaintances) are excluded as the possible perpetrator. Such also occurred in the Marianne Vaatstra case. The novelty of forensic genetic technologies aimed at predicting external visible characteristics of unknown suspects is that, for policing purposes, it groups together non-suspected individuals who look similar. In other words, individuals who have similar external visible characteristics (e.g. male, brown eyes, European ancestry) become targeted as 'interesting' subjects for further investigation, not so much by facts and circumstances derived from the crime, but by means of scientific methods and genetic insights – similar looking individuals become clustered into a 'suspect population'.[39] Each non-suspected member of this scientifically produced suspect population should then be excluded as the possible perpetrator through investigation. One method aimed at the exclusion of interesting subjects is a so-called DNA mass-screening or DNA dragnet.[40] DNA dragnets have been deployed in severe criminal investigations in various jurisdictions (e.g. USA, UK, the Netherlands, and Germany) where the police have run out of obvious suspects. It has been reported that sometimes more than one thousand individuals were requested to deliver a sample, mostly with limited or no success – an example is the Marianne Vaatstra case.[41] DNA dragnets are therefore considered to be expensive and inefficient. Yet, if more genetic knowledge regarding physical appearance of an unknown originator would become available, and if such knowledge would be more robust, then the efficacy of DNA dragnets may – in theory – increase.

Above, I described how new forensic genetic techniques aimed at inferring external visible characteristics of an unknown originator have been available and applied in criminal investigation. It was argued that this kind of knowledge clusters similar-looking yet non-suspected individuals into suspect populations. These suspect populations can become the object of DNA dragnets. Although DNA dragnets are regarded as expensive and inefficient, it is, in principle, possible to raise effectiveness and lower fiscal burdens if predictions on external visible characteristics become more precise and robust. This brings us to the topic of genetic research with the aim of *determining* external visible characteristics. In the case considered here, I am interested in research conducted

[39] Cole, Simon A., & Lynch, Michael (2006). The social and legal construction of suspects. *Annual Review of Law and Social Science, 2*, 39-60

[40] Cole & Lynch 2006, op. cit., n. 39; M'charek 2008, op. cit., n. 25; M'charek, Amade, Toom, Victor & Prainsack, Barbara (2011). Bracketing off population does not advance ethical reflection on EVCs: A reply to Kayser and Schneider, *Forensic Science International: Genetics*, doi:10.1016/j.fsigen.2010.12.012; see also: Kayser, M. and P. Schneider (2011). "Reply to 'Bracketing off does not advance ethical reflections on EVCs: A reply to Kayser and Schneider' by A. M'charek, V. Toom and B. Prainsack." *Forensic Science International: Genetics*, DOI 10.1016/j.fsigen 2011.01.007.

[41] See also: Krimsky, Sheldon and Tania Simoncelli. 2011. *Genetic Justice. DNA Databanks, Criminal Investigations, and Civil Liberties*. New York: Columbia University Press; Washington, H. (2010), 'Base assumptions? Racial aspects of US DNA forensics', in Hindmarsh & Prainsack 2010, op. cit., n. 3.

on biological samples originating in the Dutch forensic DNA database. I interpret this research as being enabled by another form of enacted forensic genetic body, elaborated below.

Sample/ID packages, scientific research and DNA dragnets

A DNA profile represents a known body, and as such stands proxy for an identified individual. In forensic practices, it is essential that a known body and a DNA profile remain connected. The method to achieve this connection is usually called the 'chain of custody', which is an administrative method that refers to procedures for 'collecting, transporting and handling legally significant material'.[42] In practice, the chain of custody consists *inter alia* of paper work, administration, stickers, and bar codes to guarantee that a biological sample obtained from a known body keeps on referring to the identity of the originator. Hence, a package containing a sample and information about the identity (ID) of the originator is created and may be called a 'sample/ID package'.[43] Authorities involved in crime investigation gain mastery over these sample/ID packages by way of their exemption from civil rights, which enables authorities to produce knowledge from those sample/ID packages, and hence can be considered another form of enacted forensic genetic body.

Sample/ID packages are retained in biobanks and as such enact the third form of forensic genetic body that I identify: the 'sample/ID bank'. This biobank represents the population of convicted offenders in the Netherlands. The Dutch DNA database is governed by the Personal Data Protection Act, and leaves room for scientific research being conducted with the *information* that it governs.[44] The Personal Data Protection Act applies not only to the (digital) DNA database and the profiles it contains, but also to the retained (biological) sample/ID packages and sample/ID bank – all these objects are legally considered to be *information*.[45] As the DNA database and its biological twin-brother represent the genetic diversity of the individuals convicted in the Netherlands, it provides geneticists ample opportunity to search for, and validate, genetic markers for new external visible characteristics to be used in criminal investigation, amongst other matters.

In 2009, the Minister of Justice allowed geneticists of the Forensic Genomic Consortium Netherlands (FGCN) to use sample/ID packages for scientific research.[46] As a result, molecular biologists currently conduct scientific research with sample/ID packages. These samples are no longer referring to the donor's individual identity, yet the Custodian of the Dutch DNA database has provided information about the place of birth of the originators. This nominal information can be used to genetically classify groups of people. For example, if the FGCN research provides enough evidence that DNA profile 'MR' is typical for donors originating from the Moroccan Rif mountains, and DNA profile 'NA' is very common for donors originating from the Netherlands Antilles, than those two profiles provide

[42] Lynch et al 2008, op. cit., n. 2, p. 114.
[43] Toom 2006, op. cit., n. 25.
[44] Staatsblad (2000). Wet van 6 juli 2000, houdende regels inzake de bescherming van persoonsgegevens (Wet bescherming persoonsgegevens) [Law of 6 July 2000 regarding rules for protecting personal data (Personal Data Protection Act)]. *Staatsblad van het Koninkrijk der Nederlanden*, 302, 1–25.
[45] Van der Ploeg, Irma (2007). Genetics, biometrics and the informatization of the body *Annali dell' Istituto Superiore di Sanità, 43*(1), 44-50; M'charek 2008, op. cit., n. 25; Toom 2010, op. cit., n. 28.
[46] Dutch Ministry of Justice, 9 February 2008. DNA-onderzoek uiterlijk waarneembare kenmerken [DNA research external visible characteristics]. Reference number 5528833/08; see also: www.forensicgenomics.nl.

information about external visible characteristics of people originating in those regions: a MR profile probably originates from someone who is fairly dark skinned and has dark hair; a NA profile probably originates someone who is black skinned with black, curly hair. Such information could aid criminal investigation in general and the organization of a DNA dragnet in particular.

There is another issue at stake when sample/ID packages are genetically researched. Although the known body itself is not being touched when sample/ID packages are examined and hence – from a legal perspective – the inviolability of the person's body is no longer at stake, the body itself remains at issue. The reason for this is the synecdochal relation of the sample/ID package and the body where the former stands in for the latter.[47] When a sample/ID package is genetically examined, two civil rights are at stake. One, privacy of the originator is at stake because his or her personal information contained in the genome can be revealed. And two, as result of the synecdochal relation between the known body and the sample/ID package, *bodily integrity* – as opposed to the right to an inviolable body – of the originator arguably is violated when the sample/ID package is examined. The right to an inviolable body and bodily integrity are usually considered to be synonymous legal categories, yet this example arguably shows that these categories can no longer be regarded as tantamount – forensic genetic bodies interfere with Constitutional categories themselves.[48]

Genetic research on reference samples originating from convicted offenders imports 'normative registers' different to those enacted and enabled by the known bodies discussed in the first part of this section.[49] First, research on reference samples violates bodily integrity and privacy of the originators. Second, storing the sample/ID packages enacts another forensic genetic body that represents the diversity of the convicted offender population in the Netherlands, the sample/ID bank. Third, the originators of the samples are withheld any kind of information, informed consent, autonomy and control over their own cellular material, arguably violating dominant values in a biomedical context.[50] As a fourth kind of normative issue, it should be noted that knowledge about external visible characteristics does not stay within the realm of laboratory walls or the (electronic) pages of scientific journals. Instead, genetic markers for external visible characteristics will, in the Dutch context, be inscribed in the Law on External Visible Personal Characteristics. In addition, this knowledge will assist the organization of DNA dragnets. Every non-suspected individual who becomes associated to the suspect population by way of their race, sex or eye colour runs the risk of becoming included in a DNA dragnet. As these 'interesting' subjects do not fit any legal category, obtaining reference samples by force cannot be applied – samples should be volunteered. This brings us to a fifth normative issue: individuals who are associated to the suspect population are requested in criminal investigations to prove their non-involvement. This is a reversal of the onus of proof and implies an erosion of the presumption of innocence.

[47] For a praxiographic investigation of synecdoche, see: Cussins [Thompson], Charis (1996). Ontological choreography: agency through objectification in infertility clinics. *Social Studies of Science, 26*(3): 575-610.
[48] See also: Van der Ploeg, Irma (2003). Biometrics and the body as information: normative issues of the socio-technical coding of the body. In David Lyon (Ed.), *Surveillance as Social Sorting. Privacy, Risk and Automated Discrimination*. New York: Routledge, p. 67.
[49] See: Cole & Lynch 2006 op. cit., n. 39; M'charek et al 2011 op. cit., n. 40; Toom 2010 op. cit., n. 28.
[50] For an extensive comparison between forensic genetic and biomedical databases, see: Tutton, Richard and Levitt, Mairi (2010). Health and wealth, law and order: banking DNA against disease and crime. In Hindmarsh & Prainsack 2010, op. cit., n. 3.

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Conclusion

Science, law and biological bodies have been at the centre of analysis in this contribution. Instead of analyzing them as separate realms, I have traced their interactions in practice and mapped their mutual effects. The analysis underscores science and law as productive forces giving shape to practices and their objects, in particular to the legal and genetic reconfiguration of bodies and bodily samples. I analyzed how the expansion of Dutch forensic DNA profiling has been dependent on access to bodies and bodily samples by focusing on three enacted forensic genetic bodies: the known body, a sample/ID package, and the sample/ID bank. These bodies are mastered by agents of power, are excluded from juridico-institutional models, and become known and 'public' by the production of genetic knowledge about them.

I demonstrated different normative registers by contrasting the enacted forensic genetic bodies with entitlements to civil rights and legal principles. The right to an inviolable body and personal life are at stake when known bodies are enacted. This observation does not mean that forensic DNA typing is wrong – on the contrary. Yet, the empirical example of DNA hunts to collect known bodies was used to argue that there is a thin line between proportionate and disproportionate measures.[51] Sample/ID packages produce or convey another normative register. It was argued that synonymous Constitutional categories like right to an inviolable body and bodily integrity can no longer be regarded the same. When genetically examined, it is hard to maintain that the object of research is not the originator's body. This was exemplified by the research currently conducted by geneticists of the FGCN. The research is conducted without the originators knowing that their sample is used for scientific research, hence they are being withheld information, informed consent, autonomy and control over their own body samples. In addition, external visible characteristics are an enabling technology for the organization of DNA dragnets which is accompanied by a reversal of the onus of proof and dissolves the presumption of innocence principle.

In conclusion, it can be stated that forensic DNA profiling has become an important aid to criminal investigation and litigation precisely because it centres on bodies and bodily samples to find truth and provide material that can be used in the administration of justice. In that capacity, forensic genetic practices interfere with more conventional mechanisms deployed by the police in the course of criminal investigation, and have been coined 'genetic policing' or the 'genetic suspect'.[52] With the ongoing advancement of forensic DNA profiling in criminal justice systems, bodies and bodily samples will become ever more important markers for finding truth and administering justice. As was argued in this contribution, forensic genetic practices interfere with the distribution of civil rights and legal principles. As forensic science and enacted laws render new hierarchical relations between agents of power and private bodies, they are at the heart of democratic societies.

[51] For the issue of proportionate measures in the context of English DNA profiling, see: ECtHR (2008). *Case of S. and Marper vs. the United Kingdom, Applications nos. 30562/04 and 30566/04, 4 December*. Strasbourg: European Court of Human Rights.

[52] Williams, R. (2010), 'DNA databases and the forensic imaginary', in Hindmarsh & Prainsack 2010, op. cit., n. 3; Williams & Johnson 2008 op. cit., n. 3; Hindmarsh & Prainsack 2010 op. cit., n. 3.